Summary of USGS Monitoring of Low-Level Mercury in the Grand Calumet River-Indiana Harbor Canal and Lake Michigan, August 2001 and May 2002

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- Mercury concentrations comparable to the Indiana water-quality standard for Great Lakes waters (1.3 nanograms per liter, ng/L) were considered “low level”.
- Data were needed to support a Total Maximum Daily Load (TMDL) for mercury in the GCR-IHC.
- USGS collected samples with ultra-clean protocols and analyzed mercury by low-level methods.
- Samples were collected during contrasting precipitation, temperature and streamflow conditions, and seasonally high and low suspended sediment concentrations—in August 2001 and May 2002.
- Concentrations of total mercury in all the GCR-IHC samples exceeded the Indiana water-quality standard but none of the samples from Lake Michigan exceeded the 1.3 ng/L standard.
- Total mercury concentrations generally were larger during the wet weather streamflow conditions in May 2002 (2.2 to 47.5 ng/L) than the dry weather streamflow conditions in August 2001 (1.9 to 13.2 ng/L).
- The largest total mercury concentrations were in the West Branch GCR near wetlands (22.5 to 47.5 ng/L) and in the IHC (16.4 to 22.9 ng/L) below the confluence of the East and West Branches GCR.
- Methylmercury generally was less than 1 percent of the total mercury concentration, and nearly all particulate methylmercury.
- Particulate total mercury was the predominant form of total mercury detected in the GCR-IHC (74 to 97 percent).
- Particulates in the water samples from the GCR-IHC were nearly all fine inorganic sediments.
- Estimated total mercury loads in the IHC were as large as 17 grams per day in August 2001 and 32 grams per day in May 2002.
- Grab samples of treated municipal wastewater effluent at two facilities had 0.6 to 6.7 ng.L total mercury in 2001 and 1.1 to 2.5 ng/L in 2002.
- Grab samples of treated process water effluent at the outfall confluence with the IHC had 1.8 ng/L in 2001 and 3.8 ng/L in 2002.

- Supplementary water-supply and effluent grab samples were collected at two steel mills and one municipal wastewater treatment facility during the same time periods as the USGS samples, reportedly by ultra-clean protocols and analyzed by low-level methods. A summary follows.
- Water from the Lake Michigan intakes at two steel mills had 0.4 to 0.7 ng/L total mercury in 2001 and 0.8 ng/L in 2002. Noncontact cooling and process outfalls at two steel mills had mean total mercury of 0.7 and 1.0 ng/L in 2001. In 2002, mean total mercury at the outfalls of one mill was 2 ng/L.
- Total mercury in treated effluent from a municipal wastewater treatment facility was a mean 1.9 ng/L in 2001 and 12.8 ng/L in 2002.